

must be provided on rates, terms, and conditions that are nondiscriminatory merely prevents an incumbent LEC from arbitrarily treating some of its competing carriers differently than others; it does not mandate that incumbent LECs cater to every desire of every requesting carrier.” 120 F.3d at 813. The Commission should not impose a rule that puts incumbents in such a position.

If the Commission does impose any new OSS requirements, it should allow sufficient time for incumbents to prepare appropriate OSS interfaces; and the Commission should make clear that incumbents of course cannot be expected to comply with already-expired deadlines that applied to existing OSS requirements. The Commission also should clarify in the unbundling context that incumbents need only provide loop qualification information for individual loops, rather than in aggregate form (by wire center, for example). U S WEST does not compile such aggregate information for its own use; indeed, its support systems lack the capacity to generate such marketing-related data without becoming overloaded. Moreover, providing information on the basis of individual loops comports with the definition of OSS, which includes pre-ordering, ordering, and provisioning. *Advanced Services Order* ¶ 56. The characteristics of loops in the aggregate are not relevant to any of those processes.

### **3. Loop spectrum management**

As noted in the *Advanced Services NPRM*, overlapping DSL signals cause service problems such as crosstalk when deployed on cable pairs within the same cable binder group. *Id.* ¶ 160; Affidavit of Mark D. Schmidt (“Schmidt Aff.”) ¶ 8 (appended hereto at Tab D). By their nature, these problems cannot be resolved by one carrier alone; cooperation among providers of differing technologies will be essential. For this reason, through the T1E1.4 standards body, the industry already has begun working to establish spectrum management standards for both incumbents and new entrants to follow. The industry standards body will address whether any

particular service or technology must be prohibited. *See Advanced Services NPRM* ¶ 160. It will likewise address whether existing nonconforming technology should be grandfathered. *See id.* ¶ 161.

U S WEST made its third presentation to the T1E1.4 working group on September 2, 1998 regarding power spectral density ("PSD") masks created by U S WEST and Bellcore. PSD masks, which are used to ensure that xDSL systems are spectrally compatible and able to tolerate each other's crosstalk without undue performance degradation, are designed to accommodate most existing xDSL technologies, including ISDN, HDSL, ADSL, and RADSL. *See Schmidt Aff.* ¶ 11. U S WEST expects that its development of PSD masks and others' contributions to the standards-setting process will adequately resolve current spectrum management issues without need for any intervention by the Commission.

#### **4. Unbundling Loop Spectrum**

It would not be technically feasible for U S WEST to permit two different service providers to offer services over the same loop. *See Schmidt Aff.* ¶ 5. U S WEST is able to provide voice and data services over a single conditioned loop because the voice and data signals are managed within a single circuit identifier and tracked in a single suite of mechanized inventory and management systems. *See id.* ¶¶ 4-5, 11-12. A new entrant that leases a loop could do the same within its own network management system. *Id.* But the fact that a carrier can use a single loop to provide multiple services does not mean that it is feasible to have multiple carriers sharing a single loop.

U S WEST's network architecture would not allow a carrier to lease only a portion of the loop. There is no technology in place to install a "firewall" for a specified spectrum allocation within the loop. *See id.* ¶¶ 7, 9. As a result, a carrier seeking to use part of

the total spectrum capacity of an unbundled loop necessarily would have access to the entire capacity of the loop. *See id.* Moreover, as noted above, loop expansion technology has exploded in recent years. Each new technology uses the loop in a different way. Frequency unbundling, which necessarily would entail splitting a loop based on a particular technology at a particular time, would make further development far more difficult, at least on the loops that have been segmented.

In any event, the concept of loop spectrum unbundling is contrary to well-reasoned Commission precedent. In the *Local Competition Order*, the Commission “decline[d] to define a loop element in functional terms, rather than in terms of the facility itself.” *Id.* ¶ 385. In particular, the Commission refused to enable an IXC to purchase a portion of the loop solely to provide interexchange service, finding it necessary to give competing providers “exclusive control over network facilities dedicated to particular end users.” *Id.* The Commission should adhere to its initial analysis, because it conforms with technical necessity as well as the purpose of section 251(c)(3).

## **5. Unbundling DLC-Delivered Loops and Subloop Elements**

a. The Commission seeks comment on methods of unbundling loops passing through remote concentration devices (*i.e.*, DLC-delivered loops) so that new entrants can provide advanced services. *Advanced Services NPRM* ¶ 170. Presently, no one served over a DLC-delivered loop can receive DSL service, whether provided by U S WEST or a competitor. U S WEST, along with the rest of the industry, is seeking a solution to this problem. The DLC architecture employed by U S WEST includes analog voice channel unit cards that cannot support xDSL services. Before xDSL services could be provided over U S WEST’s DLC-delivered loops, U S WEST would have to acquire xDSL channel unit cards to replace its

existing cards. Moreover, U S WEST would have to upgrade the bandwidth capacity of many of the links between remote terminals and central offices; current embedded DLC systems, fed by copper T1 facilities, lack the bandwidth needed for xDSL. U S WEST anticipates that next-generation DLC systems fed by fiber optic cable will offer sufficient bandwidth. Until such facilities are purchased and deployed, DLC systems cannot be unbundled so as to allow new entrants to provide advanced services.<sup>48/</sup>

b. While technical feasibility issues might prevent subloop unbundling altogether, such unbundling in any event would be best accomplished on a site-specific basis, rather than through a rulemaking by the Commission. Each FDI is unique in terms of cabinet space, surrounding space, and the availability for rights-of-way, among other things. At sites where subloop unbundling may be technically feasible, the possibility of CLEC technicians having access to FDI locations to rearrange jumper wire connections raises serious questions of network integrity. Similarly, if new entrants' facilities will terminate at U S WEST's FDIs, U S WEST believes that cable protection blocks would have to be added at the entrants' expense to prevent damage to entrants' and U S WEST's loops based on the National Electric Safety Code. Additional concerns include whether U S WEST would be required to replace existing FDI cabinets with larger facilities and install additional cross-connect cabinets; these possibilities, in turn, raise questions of who would pay for such improvements and how newly available space would be made available. No single set of solutions can be fashioned to resolve these questions. They would be best addressed cooperatively and, if disputes arise,

---

<sup>48/</sup> Other issues also would have to be addressed. Most importantly, collocation space presents an intractable problem in the context of DLC-delivered loops because the vast majority of DLC systems in U S WEST's network have been placed in equipment cabinets manufactured on a custom basis without any extra space for additional equipment.

through the state mediation and arbitration processes. *See Advanced Services Order* ¶ 55 (noting efficacy of state arbitration procedures). Finally, any cost incurred by the incumbent LEC in providing subloop unbundling must be paid for by the requesting carriers.

**C. The Commission Should Provide InterLATA Relief for Advanced Services.**

The Commission should permit BOCs to provide interLATA data services to communities and customers who cannot economically obtain such services from existing providers. In its original *Petition for Relief* and recent comments on the Commission's *Advanced Services NOI*, U S WEST demonstrated that all Americans are not sharing equally in the benefits of the Information Age. IXC's, CLEC's, and Internet backbone providers may be rushing to deploy infrastructure to serve high-end business customers in urban areas, but they are failing to invest in the facilities needed to bring high-speed data services to smaller and rural communities. This disparity is especially dramatic in U S WEST's service territory, which includes both some of the nation's fastest growing cities and some its most remote areas. Whereas a densely populated city such as Phoenix may have access to 11 high-speed (DS-3 or higher) Internet access points (also called "points of presence" or "PoPs")<sup>49/</sup> and over 800 route-miles of CLEC-deployed fiber,<sup>50/</sup> fully 16 of the 27 LATAs in U S WEST's region lack even a single high-speed Internet access point.<sup>51/</sup> These less densely populated areas are connected to the Internet, if at all,

---

<sup>49/</sup> See <<http://boardwatch.internet.com/isp/backbones/html>> (Sept. 24, 1998).

<sup>50/</sup> See U S WEST Comments on *Advanced Services NOI* at 12.

<sup>51/</sup> See <<http://boardwatch.internet.com/isp/backbones/html>> (Sept. 24, 1998).

by T1 and fractional T1 lines that are shared among many users and are more prone to congestion than the backbone connections available in urban areas.<sup>52/</sup>

The scarcity of Internet infrastructure outside of the largest cities in U S WEST's region — combined with a current Commission interpretation of section 271 that prevents U S WEST from remedying this deficit — stunts the deployment of advanced services to individuals, businesses, and institutions in smaller communities. Any customer (including an ISP) in a community without a high-speed access point that permits reliable and fast connection to the Internet must pay to backhaul its traffic to a backbone provider's high-speed PoP, and these distance-sensitive charges soon become prohibitive.<sup>53/</sup> The extra expenses of backhauling require the ISP to purchase lower-capacity connections than it otherwise would and limit the advanced services that it could otherwise provide.

Similar infrastructure limitations prevent corporations, schools, and hospitals in smaller communities from building advanced-service networks for commerce, distance learning, Internet access, and telemedicine. U S WEST can work with these institutions to build the local links of their networks but is not currently permitted to provide the interLATA links; for that, the institutions must turn to an IXC. But because the IXCs (in contrast to U S WEST) have not deployed facilities ubiquitously in these areas, the links must be routed long distances to the few PoPs that the IXCs have deployed, which raises their cost sharply. Almost half of the monthly

---

<sup>52/</sup> See *U S WEST Petition for Relief* at 17-22.

<sup>53/</sup> For example, an ISP in Sioux Falls, South Dakota (which lacks a DS-3 PoP in its LATA) must pay to haul its traffic either 180 miles to Digex's DS-3 PoP in Omaha or 270 miles to the UUNet or GTE PoPs in Minneapolis. A DS-1 link over the shorter route will cost the ISP more than \$1,300 per month, and the cost for a DS-3 connection is \$22,000 per month. See *U S WEST Petition for Relief* at 23.

telecommunications budget of Colorado Mountain College's 13-campus high-speed data and video network, for example, goes to pay for a single interLATA connection from Glenwood Springs to Leadville; even though the cities are just 60 miles apart, the IXC providing the link routes the traffic through its PoP in Colorado Springs, extending the connection to 255 miles and raising its monthly cost to \$6,600. If U S WEST were permitted to provide this last link of the network, it could bring the cost down to \$1,600 per month.<sup>54/</sup>

The NPRM asks whether the existing exceptions to Section 271 for "incidental interLATA services" are sufficient to enable the BOCs to cure these infrastructure shortages. *Advanced Services NPRM* ¶ 191. The answer is clearly no. The traffic that these exceptions permit the BOCs to carry is simply too thin to justify building the needed facilities. For example, 47 U.S.C. § 271(g)(2) permits U S WEST to provide interLATA Internet services to elementary and secondary schools, but only over dedicated facilities. It does not make economic sense to build a full data network solely to serve the traffic generated by these schools, as U S WEST learned in attempting to deploy frame relay networks to Bureau of Indian Affairs elementary and secondary schools in rural Arizona and New Mexico. In the single-LATA state of New Mexico, and within each of Arizona's LATAs, U S WEST could build on its existing frame relay network to provide the schools with cost-effective end-to-end connections; the fact that U S WEST could carry ordinary business traffic over the same facilities it built for the

---

<sup>54/</sup> See U S WEST Comments on *Advanced Services NOI* at 17. Similarly, U S WEST's legal inability to provide interLATA data links forces the University of Colorado to pay more for its statewide telemedicine network. The interLATA links of the network provided by an IXC cost much more for similar distances than the intraLATA connections provided by U S WEST. For example, a 200-mile intraLATA connection between Grand Junction and Cortez provided by U S WEST costs the University \$2,800 per month, while an IXC-provided 180-mile link between the University and Trinidad costs \$3,800 per month. See *id.* at 16.

schools justified its making the investments needed to extend the network. But the economic case is not there for U S WEST to build the interLATA links of this network in Arizona, notwithstanding section 271(g)(2)'s permission, because the section applies only to facilities "dedicated" to the schools' use and thus does not permit integrated use of those facilities for other customers. Instead, the schools had to purchase these links from an IXC, adding \$3,200 per month to the cost of the Arizona network above what the (single-LATA) New Mexico network cost.<sup>55/</sup>

The single-project LATA boundary modifications that the Commission proposes — elementary and secondary schools (*id.* ¶ 192), other institutions (*id.* ¶ 196) — would likewise do little to speed the deployment of advanced services to underserved communities. While there may be a handful of institutional networks with traffic sufficient to justify the construction of new facilities, such as the inter-university "Westnet2" ATM network described in U S WEST's original Petition for Relief,<sup>56/</sup> the majority of these projects would not involve traffic volumes sufficient to support the costs of deployment. U S WEST could provide the necessary facilities to the institution at a reasonable price only if it could carry general data traffic over these

---

<sup>55/</sup> See U S WEST Comments on *Advanced Services NOI* at 17-18.

<sup>56/</sup> Westnet2 was a proposed wide-area ATM network that would have connected Arizona State University, the Colorado School of Mines, Colorado State University, the Universities of Colorado at Boulder and Denver, the National Center for Atmospheric Research, the University of New Mexico, the University of Utah, Utah State University, and other institutions. In March 1997, these institutions asked U S WEST (which had built many of their individual ATM and frame networks) to submit a proposal to build Westnet2. Because of the interLATA restriction, U S WEST could not build the integrated wide-area network that the institutions wanted; instead, it could only propose to build a series of smaller ATM networks connected by cell-relay links purchased from an IXC. The institutions thought that the use of a second carrier to provide the interLATA links of the network decreased its reliability, and they put the project on hold. See *U S WEST Petition for Relief* at 30-31.



facilities and spread their cost across these other services. To be sure, if a single project *would* involve interLATA traffic sufficient by itself to justify the deployment of new facilities, and if the potential customer or the BOC can demonstrate that the BOC's participation in the project would save the customer a significant amount, the Commission *should* modify LATA boundaries to allow the BOC to build the customer's network. But the Commission must recognize that there likely will be relatively few networks for which this will be the case.

Similarly, the Commission should implement its tentative decision to modify LATA boundaries to permit BOCs to carry traffic to high-speed Internet access points from areas that lack such PoPs, *id.* ¶¶ 193-94, in a way that actually enables BOCs to take advantage of the relief and provide the services that the Commission is hoping to encourage. The Commission should permit BOCs to aggregate the data traffic necessary to enable them to deploy new facilities and spread their costs over multiple customers. It can best do this by allowing the BOCs to carry data traffic of any kind between any customer in an un- or underserved LATA — individual, institutional, or corporate — and one or more high-speed Internet access points in neighboring LATAs. (Allowing connection to multiple access points increases the reliability of service.) To encourage the rapid deployment of advanced telecommunications capability to unserved areas, the Commission should only require a BOC to (1) demonstrate that a given LATA lacks a DS-3 or faster PoP at the time of application, and (2) describe the Internet access points it would like to connect to and the facilities it plans to build. Contrary to the NPRM's suggestion, *id.* ¶ 195, a LATA boundary modification, once granted, should be permanent: Because the future expiration of a modification would strand the BOC's investment in interLATA facilities, a BOC would be unlikely to undertake the necessary investment in the first place if there were a real risk of expiration — especially if the conditions that would trigger such

an expiration (for example, the future construction of alternative transport facilities) were within its competitors' sole control.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "William T. Lake", written over a horizontal line.

William T. Lake  
John H. Harwood II  
Lynn R. Charytan  
Jonathan J. Frankel  
Matthew A. Brill  
WILMER, CUTLER & PICKERING  
2445 M Street, N.W.  
Washington, DC 20037  
(202) 663-6000

Of counsel:  
Dan L. Poole

Robert B. McKenna  
Jeffrey A. Brueggeman  
U S WEST, INC.  
1020 19th Street, N.W. Suite 700  
Washington, DC 20036  
(303) 672-2861

*Counsel for U S WEST Communications, Inc.*

September 25, 1998

## SERVICE LIST

Chairman William E. Kennard  
Federal Communications Commission  
1919 M Street, N.W., Room 814  
Washington, DC 20554

Commissioner Susan Ness  
Federal Communications Commission  
1919 M Street, N.W., Room 832  
Washington, DC 20554

Commissioner Harold Furchtgott-Roth  
Federal Communications Commission  
1919 M Street, N.W., Room 802  
Washington, DC 20554

Commissioner Michael Powell  
Federal Communications Commission  
1919 M Street, N.W., Room 844  
Washington, DC 20554

Commissioner Gloria Tristani  
Federal Communications Commission  
1919 M Street, N.W., Room 826  
Washington, DC 20554

A. Richard Metzger  
Chief, Common Carrier Bureau  
Federal Communications Commission  
1919 M Street, N.W., Room 500  
Washington, DC 20554

Secretary Magalie R. Salas  
Federal Communications Commission  
1919 M Street, N.W., Room 222  
Washington, DC 20554

International Transcription Services, Inc.  
1231 20th Street, N.W.  
Washington, DC 20026

Dale N. Hatfield  
Chief, Office of Engineering and Technology  
Federal Communications Commission  
2000 M Street, N.W., Suite 480  
Washington, DC 20554

Robert M. Pepper  
Chief, Office of Plans and Policy  
Federal Communications Commission  
1919 M Street, N.W., Room 822  
Washington, DC 20554

Larry Strickling  
Deputy Chief, Common Carrier Bureau  
Federal Communications Commission  
1919 M Street, N.W., Room 500  
Washington, DC 20554

Carol Matthey  
Chief, Policy and Program Plan Division  
Federal Communications Commission  
1919 M Street, N.W., Room 544  
Washington, DC 20554

Jason Oxman  
Policy and Program Plan Division  
Federal Communications Commission  
1919 M Street, N.W., Room 544  
Washington, DC 20554

**ATTACHMENTS**  
**to**  
**COMMENTS OF U S WEST COMMUNICATIONS, INC.**  
**in**  
**CC Docket No. 98-147**

| <u>Tab</u> | <u>Item</u>  |
|------------|--|
| A.         | Clifford L. Fry, et al., <i>The Economics of Structural Separation from the Perspective of Economic Efficiency</i> (1995).                           |
| B.         | Jerry A. Hausman and Timothy J. Tardiff, <i>Benefits and Costs of Vertical Integration of Basic and Enhanced Telecommunications Services</i> (1995). |
| C.         | Booz, Allen & Hamilton, <i>The Benefits of RBOC Participation in the Enhanced Services Market</i> (1995).  |
| D.         | Affidavit of Mark D. Schmidt   |

A

**THE ECONOMICS OF STRUCTURAL  
SEPARATION FROM THE PERSPECTIVE  
OF ECONOMIC EFFICIENCY**

**FINAL REPORT**

Agreement No. 9500046315

**Prepared by:**

Clifford L. Fry, Ph.D.  
James M. Griffin, Ph.D.  
Donald R. House, Ph.D.  
Thomas R. Saving, Ph.D.

RRC, Inc.  
3833 Texas Avenue, Suite 285  
Bryan, Texas 77802

**Prepared for:**

U S WEST Communications  
Strategy Development  
1801 California Street  
Denver, Colorado 80202

April 4, 1995

# **THE ECONOMICS OF STRUCTURAL SEPARATION FROM THE PERSPECTIVE OF ECONOMIC EFFICIENCY:**

## **ABSTRACT PREPARED BY RRC, INC.**

This report addresses the key issues in the debate about whether to adopt regulations that require BOCs to offer enhanced services only through separate subsidiaries. Our analysis evaluates these issues using the criteria of consumer welfare and efficiency in production, innovation, and marketing. Economic analysis indicates the BOCs should be allowed to provide enhanced services through an integrated structure. Replacing a market determined structure with a structure prescribed by regulatory fiat will result in significant welfare losses.

A forced subsidiary structure imposes significant costs that will ultimately be borne by consumers of LEC basic services and enhanced services. The imposed costs include one-time separation costs, higher costs of basic and enhanced services due to loss of joint production complementarities, and higher costs of innovation and a slowing of innovation due to loss of technological synergies arising only from an integrated structure.

The benefits claimed by the proponents of structural separation are either overstated or nonexistent. Some benefits are provided by regulations other than structural separation, such as ONA. Proponents claim that structural separation would provide necessary safeguards against access discrimination. However, the necessary conditions for profitable access discrimination are not met. Even if access discrimination was profitable, structural separation would have no effect on the result. In contrast with what is assumed by proponents of structural separation, the BOCs could not engage in access discrimination without being detected. There are sufficient safeguards against access discrimination in existing penalties, ONA provisions, anti trust laws, and the threat of regulatory change.

Proponents claim that in an integrated structure, BOCs will be able to shift costs from enhanced services into the rate base for basic services, resulting in higher prices to basic service rate payers and prices below cost for enhanced services provided by BOCs. The premise is that BOCs will use their monopoly in local services to try to monopolize the enhanced services market. This strategy is not founded in economic analysis, which indicates the BOCs are more likely to benefit from selling access to a competitive market. The economic incentives are for the BOCs to price enhanced services to maximize profits.

Any of the benefits sought by the proponents of structural separation are available with market driven unbundling and the pricing of the unbundling at cost. These non-structural remedies are available with ONA. Most importantly, the coming competition in LEC basic services will require the BOCs to aggressively market their LEC basic services if they are to maintain their market position.

The lessons from other industries underscore the benefits of market determined firm organization. In the banking industry, the natural gas pipeline industry, and the airline industry, regulators have attempted to level the playing field only to withhold welfare enhancing efficiencies from the market. Structural separation in the production of enhanced services would be a replication of these mistakes.

In summary, if structural separation is imposed, consumers of LEC basic services and enhanced services will pay higher prices and wait longer for products to be introduced, implying significant welfare costs.

# **The Economics of Structural Separation from the Perspective of Economic Efficiency**

## **I. Introduction**

Current controversy centers on whether the regional Bell Operating Companies (BOCs) should be allowed to continue providing enhanced telecommunications services through an integrated firm structure or whether enhanced services must be offered through separate subsidiaries with separately located facilities and separate management. Proponents of structural separation argue that only by separating the provision of basic local service from enhanced service can the public be protected from various abuses. Some consumer groups see separation as protecting basic service customers from being charged costs attributable to enhanced services under the existing integrated firm structure. Some enhanced service providers (ESPs), such as MCI, see structural separation as a safeguard against potential monopolistic abuses from the BOCs attempting to leverage their monopoly power in basic services into the enhanced services markets. Still other providers of enhanced services feel that structural separation would eliminate an important BOC cost advantage, with the result being a "level playing field". In contrast, the BOCs argue that the separation of basic services from enhanced services would result in a higher cost, more inefficient form of organizational structure, with the result that both consumers of basic services and enhanced services will pay higher prices.

Interestingly, the claims of both sides may be true to varying degrees, leaving policy makers in a conundrum of choosing between conflicting policy goals. For example, how are policy makers to resolve the tradeoff between a "level, but high cost playing field" favoring independent enhanced service providers versus higher prices to consumers of basic and enhanced services? Fortunately, if policy makers are willing to adopt as their policy criterion the notion of economic efficiency, very clear policy directives emerge. This report views the structural separation issue as a problem for applied welfare analysis, requiring policy makers to make informed estimates about the costs and benefits of structural separation.



Section II identifies three distinct costs arising from structural separation. First, separation would result in significant "one-time separation costs" associated with physically disrupting ongoing integrated operations, changing physical locations, modifying software and hardware equipment, incurring search costs associated with new personnel, and disposing of excess capacity in the parent company. Second, structural separation would raise the day-to-day costs of providing basic and enhanced services because cost complementarities favor joint production. Third, structural separation would impose both higher research and development (R & D) costs and slower new product innovation, because technological synergies arising from joint R & D would be lost with separation.

Section III considers the alleged benefits arising from structural separation. Specifically, we address three benefits claimed by proponents of structural separation. First, structural separation is believed by some to provide stronger safeguards against access discrimination, thereby fostering competition in enhanced services markets. Second, separation is presumed to prevent accounting abuses from loading the costs of enhanced services into the basic service rate base since enhanced services would effectively reside in a separate subsidiary for accounting purposes. Third, separation would presumably eliminate the incentive to cross subsidize the price of enhanced services by using profits earned in the basic service market to underprice enhanced services, allowing BOCs to monopolize these markets as well.

Section IV recapitulates the findings of Section II and III and argues that structural separation will only result in substantial costs and minor benefits. Instead of structural separation, we emphasize the importance of two key non-structural remedies that will produce the benefits sought in Section III without resulting in the costs in Section II. Specifically, we emphasize the desirability of unbundling access services to ESPs and pricing these access services at cost. Unbundling, which does not depend on structural separation, prevents the BOCs from restricting entry into enhanced services and facilitates competition. Pricing access services at cost promotes long run efficiency. These non-structural remedies are key components of the existing policy of Open Network Architecture (ONA). Their continued vigorous enforcement is a proper policy action.

Section V looks at the issue of structural separation from the broader perspective of what determines efficient firm structure--the extent of vertical integration, joint production, and corporate governance. Examples from banking, pipelines, and airlines show that regulations have often

inhibited the evolution of efficient industry structure. These examples provide strong reasons why regulatory fiat should not replace that of the market in determining firm and industry structure

## **II. Costs of Structural Separation**

### **A. One-Time Separation Costs**

Structural separation, imposed after its relaxation in Computer III, would lead to substantial costs that would ultimately be borne by the consumer. U S WEST staff has determined that a return to the requirement of structural separation would cost between \$58.7 million and \$90.6 million.<sup>1</sup> This does not take into account perhaps even greater costs attributed to dislocation, structural duplication, and management inefficiencies. On the consumer side, the one-time separation actions could impose inconvenience and economic loss upon consumers as services are temporarily interrupted during the transfer.

#### **1. Direct Expenses of Building and Equipment**

The U S WEST study of separation costs include an estimated \$11.979 million for equipment and software to support the anticipated 2,500 member subsidiary staff. Another \$1.024 million must be spent on installation and \$2.086 million on support personnel. The PBX, internal cabling, data and voice circuits, and uninterruptable power supply will cost another \$3.165 million. Administrative support is expected to cost \$1.049 million. Related taxes are estimated to be \$.655 million. The total equipment, support personnel, software, and taxes, therefore total \$20.961 million.

The study presents two alternatives to housing the subsidiary: an owned facility and a leased facility. The owned option would cost \$69.600 million and the lease option would cost \$37.717

---

<sup>1</sup>See "Structural Separation of Enhanced Service Offerings," US West Management Information Services, March 29, 1995.

million. The lease cost is an annual reoccurring expense. Overall, the estimated costs of separation is reported to be \$90.561 million (owned facility) or \$58.677 million (leased facility). At any reasonable discount rate, the owned facility option produces the least present value cost.

## **2. Disruption Costs**

The process of transferring operations into a separate facility requires significant downtime for affected staff. Those being transferred into the new subsidiary must prepare their work-environment for the physical relocation. During the transport of the materials, staff cannot function effectively. Unpacking materials takes additional time. For a realistic estimate, one must expect that some materials will be mis-routed, requiring extra days to locate and transfer.

New hires require time to become as productive as those being replaced. Teams of personnel must be united and operating procedures defined. For the less skilled, this transition may require days. For skilled personnel, this transition may require months. During this time, productivity will suffer, resulting either in added costs or reduced levels of service to the customer base.

## **3. Excess Capacity Costs**

With the transfer of personnel and equipment to the subsidiary, the existing offices of U S WEST would be underutilized. At least 45,000 square feet of office space would be vacated, and an extensive amount of computer equipment, telephone equipment, and cabling would remain in the vacated premises. If these facilities being vacated were leased, the option for renewal would be rejected, but the equipment would have to be stored or discarded. If the space were owned, U S WEST would presumably lease the space to outside firms, also necessitating the removal of equipment, furniture, etc. These costs have not been included in the estimates.

## **B. On-Going Cost Complementarities in Operations and Marketing**

Cost complementarity is a simple but important concept. Strictly defined, a firm experiences cost complementarity when the production of one product leads to reduced costs of producing another product. A simple example of cost complementarity can be borrowed from the agricultural sector. Apples and honey are jointly produced. The bees pollinate the apple blossoms, increasing apple production. The nectar from the apple blossoms increases honey production. Therefore, it is not surprising that the two activities are performed jointly. The average cost of production is reduced if production is joint.

### **1. Cost Complementarities in Operations**

Cost complementarity is a primary reason for integrated personnel, equipment, and facilities in the provision of enhanced services. This cost complementarity largely stems from the nature of the production processes for both basic services and enhanced services. Both are substantially computer dependent, and development and improvement of these services entail changes in and extensions of computer software. It is this production environment that partly establishes the interdependence of the two production processes.

As new software designs are considered in basic services, there are always multiple paths to the same destination. However, there is often one path that is particularly conducive to the unbundling of a basic service that is valuable in the provision of a marketable enhanced service. Consider a hypothetical example. New software techniques become available that will speed the reset of a dialtone when a customer wants to make a second call. Two methods are possible to incorporate the new software technique into existing systems. One replaces an existing module that "remembers" the customer's previous call numbers. The other method utilizes the existing module but inserts a "call" to a new subroutine, leaving the structure of the old module intact. An enhanced product could be developed wherein the customer, making a series of calls, can retrieve previous call numbers. The new service allows the customer to "scroll" through the previous numbers and re-enter any on the existing list.

Without the knowledge of the planned enhanced service, the programmer is just as likely to insert the new module as utilize the call to the subroutine. If the call to the subroutine is selected, the costs of extracting the previous customer-dialed numbers is relatively inexpensive. If the new module is inserted, the previous numbers are not retained and new software must be built to capture those numbers. Only with the joint realization of enhanced products possibilities and the routine upgrading of system software can the cost complementarities be captured. Structural separation eliminates this cost complementarity.

The industry has already experienced the effects that structural separation has on the provision of enhanced services. The earliest provision of Voice Messaging Services (VMS) by AT&T was cancelled due to the structural separation requirement.<sup>2</sup> Within U S West, numerous enhanced services to be deployed will be scrapped with structural separation because the ongoing costs of providing these services will increase significantly.

A number of other examples of the loss of cost complementarities through structural separation is available from U S WEST and other BOCS. U S WEST's experience in the provision of ESI (an enhanced fax facility) is one example. U S WEST introduced ESI through its U S WEST subsidiary. The election to provide ESI through a subsidiary was not imposed by CI-II but was an internal decision based upon the need for additional space and the failure to realize full cost complementarities. The formal report from an interview with the head of ESI includes the following comments:<sup>3</sup>

"Separation made this situation harder...

Customer must separately buy 'call forward busy/no answer' (which is not ONA) and be billed separately for it, ...

Also harmful in the channel: i.e., inability to use U S WEST channels, ...

Under CI-II rules could/would have integrated marketing, ...

Part 64 gave separate sub a bad deal on using parent resources, ...

---

<sup>2</sup>See Hausman, Jerry A. and Timothy J. Tardiff, Costs and Benefits of Vertical Integration of Basic and Enhanced Telecommunications Services, March 29, 1995.

<sup>3</sup>Interview with Jeri Korshak, former head of ESI.

Systems costs very high due to separate facilities, ...  
Didn't realize potential of integrated messaging."

In the end, U S WEST pulled the product from the market, booking a \$100 million operating loss (before taxes) over a three year period. The post-mortem evaluation illustrates the importance of integrated personnel and facilities.

Structural separation would eliminate the existence of cost complementarities in the provision of enhanced services. Substantial losses would be felt in at least two additional areas: marketing and R&D. The ensuing higher costs would result in either higher prices of those services that are brought to market or the exclusion of services whose expected returns fail to meet corporate standards. In either situation, consumer welfare would be reduced.

## **2. Cost Complementarities in Marketing**

U S WEST currently utilizes marketing resources jointly employed in the sales of basic services and enhanced services. This reduces the need to duplicate marketing efforts and enables U S WEST to offer lower prices for both basic and enhanced services. Not only does joint marketing save resources in the production of these marketing services, customers value the convenience of being able to order a variety of services through a single source.<sup>4</sup> This is a complementarity that would be eliminated with required facility separation since the subsidiary offering enhanced services could not make use of marketing personnel involved in marketing of local exchange carrier (LEC) base services. The additional costs of separate marketing necessarily must be borne by the consumer.

---

<sup>4</sup>Evidence from the market for long distance services suggests that competitors do not substantially suffer from joint marketing. Long distance competitors to the "default" long distance carrier achieved growing market shares. The inconvenience of placing a call to the competitor proved to be insignificant. Price was the determining factor in long distance markets, and price should be the determining factor in the provision of enhanced services.

## **C. R&D Cost Complementarities**

### **1. Technical Aspects Creating Cost Complementarities**

U S WEST utilizes innovation complementarities in the development of enhanced services. Technical personnel in basic services, when combined with new-product designers for enhanced services, form a research team that more efficiently travels from an idea to an innovation. This combination reduces R&D efforts and brings products to the market more quickly and less expensively. These innovation efficiencies are common when product innovation requires multiple sets of expertise. To maintain strict separation is to eliminate much of the engine of invention. NERA shows that structural limitations delayed the development of numerous enhanced services and computed the welfare losses totalling over \$100 billion per year.<sup>5</sup> The simple point is that new products confer large benefits to consumers--far more than the prices they pay. When a product never reaches the market or is delayed, society is worse off.

Other evidence that an integrated system provides innovation advantages over an imposed subsidiary structure stems from the modern organization and conduct of research in areas outside telecommunications. This examination proves that there is a risk of loss of research efficiency in forcing a separation between the provision of basic and enhanced services among BOCs. Structural separation also reduces the overall level of research activity if complementarity exists. When operations are structurally separate, benefits of research in a single structure that spillover to the other structure are ignored in evaluating the profitability of the research. In effect, structural separation results in the introduction of externalities that yield an inefficient level of research activity. In a free market, when significant externalities exist, firm structure is altered to internalize the externalities. Forced structural separation entails a loss of efficiency by not allowing the internalization of research externalities.

Consider the treatment of joint research by legislatures. The antitrust laws of the United States are designed to prevent collusive activity among firms. Yet, the one area of cooperation among firms that is universally viewed as advantageous is joint research because such joint research

---

<sup>5</sup>See Hausman and Tardiff (1995).

internalizes any spillover benefits. Many have advocated that antitrust policies should be changed to encourage joint research.<sup>6</sup> The advantages of research cooperation are viewed as potentially great, and the risk of collusive action for purposes of monopolization arising from this activity is viewed as small. This is an important consideration, as the opponents of the integrated approach claim risk of monopolization by BOCs as a reason for separating the people most knowledgeable about the basic service network from those concerned with enhanced services. What the proponents of separate subsidiaries are trying to accomplish is complete separation of the BOCs into separate companies along lines of the type service offered. This is a backwards move from the standpoint of innovation in the technology used to access the local service distribution system, long run competition, and consumer welfare.

Joint research has been encouraged through legislation, such as the 1984 National Cooperative Research Act, which encourages joint research by exempting the involved companies from punitive damages or the trebling of damages should they be convicted of violating antitrust laws. Such cooperation is not evidence of violation of antitrust laws, and 111 cooperative joint research endeavors were undertaken between January 1985 and June 1988.<sup>7</sup> Also, "major research consortia have been established in recent years in such diverse areas as glass bottles, computers and semiconductors, and boiler pumps for power plants. In December 1988 a Presidential commission urged the creation of several consortia comprised of industry, government, and university laboratories

---

<sup>6</sup> See Ordoover, Janusz A. and Robert D. Willig, "Antitrust For High-Technology Industries: Assessing Research Joint Ventures and Mergers", *Journal of Law and Economics*, 1985, 28: 311-33; Grossman, Gene and Carl Shapiro, "Research Joint Ventures: An Antitrust Analysis", *Journal of Law, Economics, and Organization*, 1986, 2:315-37; Brodley, Joseph F., "Antitrust Law and Innovation Cooperation", *Journal of Economic Perspectives*, 1990, 4:97-112; Jorde, Thomas M. and David J. Teece, "Innovation and Cooperation: Implications for Competition and Antitrust", *Journal of Economic Perspectives*, 1990, 4: 75-96; Shapiro, Carl and Robert D. Willig, "On The Antitrust Treatment of Production Joint Ventures", *Journal of Economic Perspectives*, 1990, 4: 113-30.

<sup>7</sup>Jorde, Thomas M., and David J. Teece, Innovation, Cooperation, and Antitrust, Berkeley, 1988.



for research in superconductivity..."<sup>8</sup> Even international joint ventures in research are becoming increasingly common.<sup>9</sup>

The concern of non-BOC ESPs is that the offering of LEC basic services and enhanced services within one firm will lead to anticompetitive behavior. The typical concern in other industries is that the joint research effort will also result in a collusive setting of the prices of the developed products. This concern is not transferable to telecommunications.

The need for coordinated development in LEC basic services and enhanced services is increasing with time. Technological changes occur very rapidly in the provision of LEC basic services, and most of these technological changes occur in the form of computer software changes. The industry has been on a continual move in the direction of computer-controlled switching from mechanical switching. Unlike mechanical switching devices of the 1980s, computer software opens vast expanses of possible paths to the same destination. Unless the path taken is the ideal path that interfaces best with the production of a particular enhanced service, there are inefficiencies generated that were unintended but unavoidable without a close interrelationship between the two operations.

## **2. The CEI Plan Safeguard**

The rate of flow of new products introduced in the market is restricted whenever the potential profitability of an innovation is reduced. One safeguard, CEI plans, has the potential of restricting this rate of flow. Current implementation of CEI plans as a safeguard appear to have had little impact upon innovation. Appendix A lists enhanced services which have moved through U S WEST's innovation pipeline. However, disclosures of new product plans before their release can destroy the critical time protection that innovators capture in pioneer products.

The time between the deployment of a new product and the replication of the product by competitors gives the pioneer firm time to capture profits that justify the investment in R&D. The importance of this protection has been recognized by legislatures who have enabled firms to use

---

<sup>8</sup>Bolter, Walter G., McConnaughey, James W., and Fred J. Kelsey, Telecommunications Policy for the 1990s and Beyond, M.E. Sharpe, Inc., 1990, page 61.

<sup>9</sup>Carleton, Dennis W. and Jeffrey M. Perloff, Modern Industrial Organization, Harper Collins, 1994, page 685.